

REMARKS

Reconsideration and allowance of this application, as amended, are respectfully requested.

Claim Status

Claims 1-18 remain in the application.

Prior Art Rejections

Claims 1-18 were rejected under 35 USC 103(a) as being unpatentable over Reinberg (US Patent 6,120,942) in view of Isao et al (US Patent No. 5,482,799). This ground of rejection is respectfully traversed.

Claim 1 has been amended to include limitations of claims 2-4, which have been cancelled.

Reinberg relates to a photomask having multiple absorption levels. It includes an etch stop and light absorption layers but does *not* employ any *phase shifting layer*. The reference mentions something related to phase shifting at column 1, lines 45-62. However, this passage does not suggest a light absorption layer and a phase shifting layer interspersed concurrently.

Isao et al disclose a phase shifting layer that can convert the phase of light transmitted through it by 180°. However, it does not teach the use of a phase shifting layer with a light absorption layer.

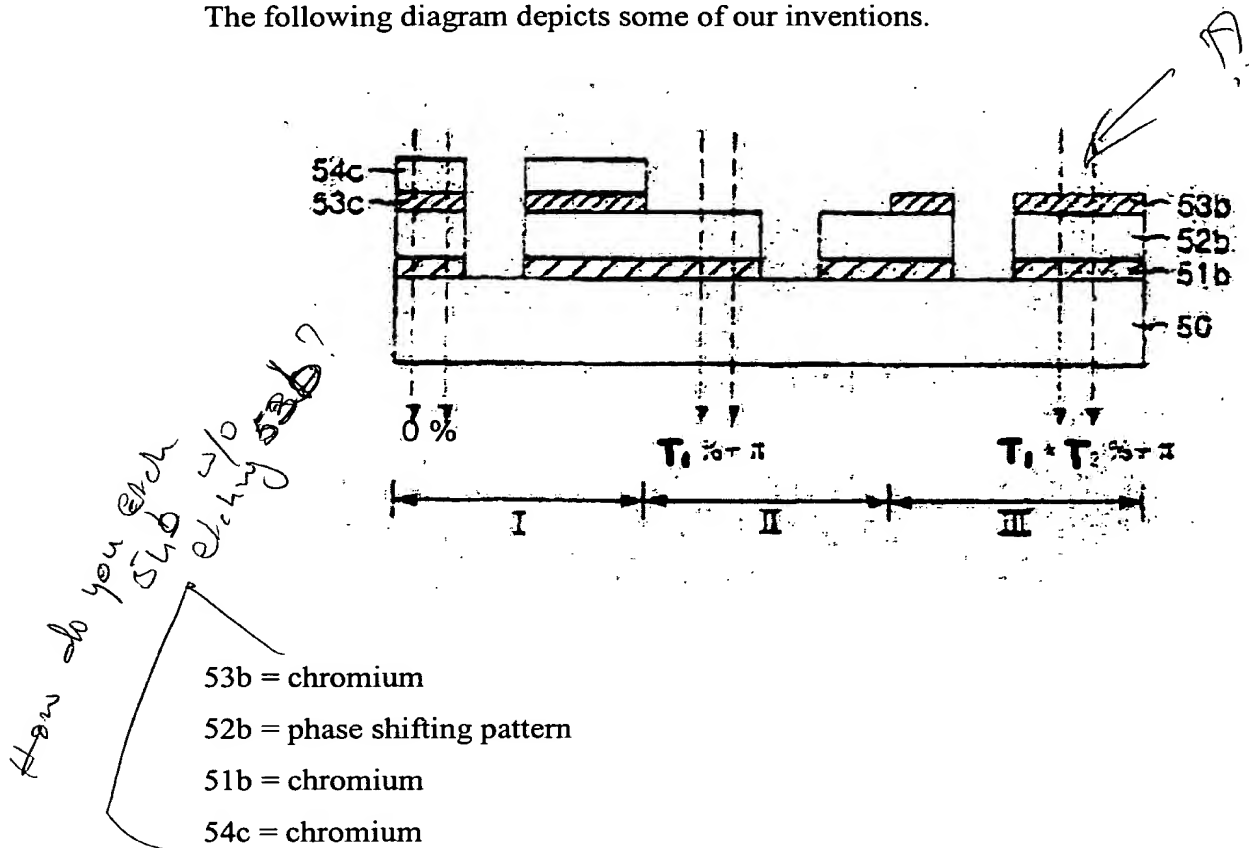
Claims 1-18 were also rejected under 35 USC 103(a) as being unpatentable over Reinberg (US Patent 6,120,942) in view of Nguyen et al (US Patent No. 5,906,910). This ground of rejection is also respectfully traversed.

Nguyen et al mention the possibility of combining a phase shifting layer and a light absorption layer at column 4, lines 32-36. However, Nguyen does not specifically teach or even suggest our combination of phase shifting layer and light absorption layer applied to specific regions of a circuit structure.

According to our claimed inventions, we fabricate a phase shifting mask having multiple transmittance function for the purpose of a specific use like DRAM fabrication process, the mask comprises three areas, a scribe lane area having a high transmittance, and a cell area having a low transmittance. For this, the new process procedure improves the degree of integration of the semiconductor device and the production yield. The references do not teach or even suggest our claimed combinations of structure.

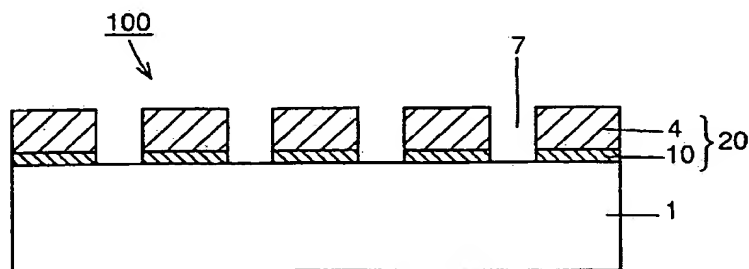
The following diagrams are presented to further explain various differences between our claimed inventions and the prior art teachings cited by the Examiner.

The following diagram depicts some of our inventions.



The following are Figures 1 and 7 from the Isao et al reference.

FIG.1



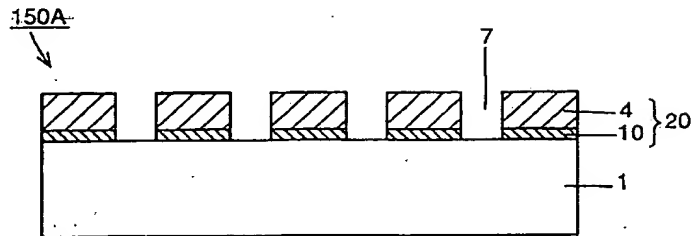
4 = Monolayer film (Molybdenum silicide oxide film)

10 = transmitting film

20 = phase shifting portion

1 = quartz substrate

FIG. 7



4 = Monolayer film (Molybdenum silicide oxide film)

10 = transmitting film (chromium oxide)

20 = phase shifting portion

1 = quartz substrate

* monolayer = phase shifting

The following is Figure 4 of the Reinberg reference.

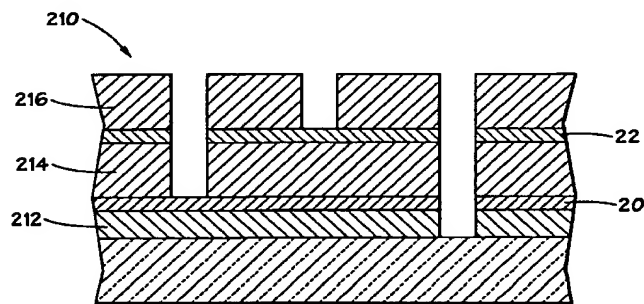


FIG. 4

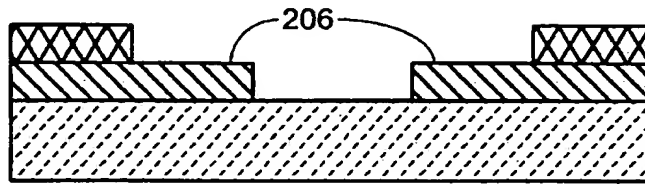
20, 22 = etch stop layer (silicide oxide)

216, 214, 212 = light absorbing layer (amorphous silicon)

* materials used for light absorbing layer: chromium, titanium, titanium nitride, tungsten molybdenum.

The following is Figure 18e of the Nguyen reference.

Fig. 18e



Top layer: chromium

* Intermediate layer: Quartz substrate

Note: Nguyen mentions the combination of the light absorbing layer and phase shifting layer are quite advantageous (column 4, lines 36-41).

All outstanding matters having been addressed, it is respectfully submitted that the present application is in a condition for allowance and a Notice to that effect is earnestly solicited.

Respectfully submitted,
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